Dynamic Transmitor

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Transmitters that measure temperature, pressure, flow and other parameters have been used industrially as "field devices" for programmable electronic systems (PES), such as programmable logic controllers or process control computers, for many years. When you are only measuring a single value, they can be very useful.

Vibration is a **dynamic** measurement parameter. The output signal from a proximity measurement system is a rich, complex signal containing information about overall amplitude, phase, probe gap (position of the shaft), form or shape, and frequency. To concentrate on overall amplitude is not good machinery management practice, especially for those machines that can cause a significant revenue loss or have a negative effect on the safe operation of your facility if they fail. Therefore, a vibration transmitter must provide **TWO** kinds of outputs: a proportional output, which, when imput into a PES, will provide operators with overall machinery condition information, and a dynamic transducer signal output, which will provide machinery specialists with machinery diagnostic information.

Designing a high quality field device, which can be used in a wide range of machinery monitoring applications, and which provides two separate outputs, is not an easy task. However, Bently Nevada has successfully achieved this goal and is pleased to introduce the Dynamic Transmitor Module (DTM).

Relative Vibration Transmitor — the "Heart" of the Dynamic Transmitor Module

The DTM is the first field device which can accurately provide **TWO** types of information: Basic 4—20 mA signals for your process control needs, **PLUS** industry standard buffered dynamic transducer signal outputs for machinery diagnostics. Since operators require different machinery information than machinery specialists, the two signals are completely isolated from each other. This way, machinery specialists can connect their test equipment to the dynamic transducer signal outputs without fear of creating ground loops which can affect the accuracy of the machinery operator's information. Inaccurate information could cause the operator to needlessly shut down a machine.

The DTM is only part of a complete machinery monitoring system. Functions, such as operator display, alarm indication and fault recognition, must be performed by your PES. Since these systems tend to consider the proportional output of a vibration transmitter as "just another process variable," it is important for you to recognize that the level of machinery protection with a DTM/PES system may not be as high as a more traditional, dedicated Bently Nevada monitoring system.

To meet the requirements of different machinery monitoring applications, Bently Nevada Vibration Transmitors accept signals from proximity, velocity and acceleration transducers. Since axial thrust position is often monitored along with radial vibration, a Thrust Position Transmitor has been developed as well.

Because these Transmitors may be used as field devices for Emergency Shutdown Systems or Safety Instrumented Systems, each Transmitor design includes features that assure signal integrity. Some of these features are:

Isolated outputs — Isolated outputs greatly simplify grounding requirements. They allow the power source, the test equipment connected to the dynamic transducer signal, and the instrumentation connected to the analog signal (i.e. your PES) to be tied to separate grounds without causing ground loops. Ground

Module™

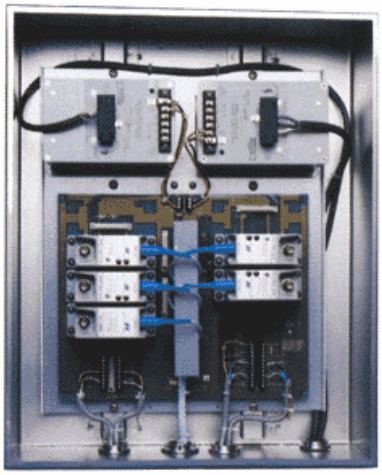
loops can adversely affect the accuracy of the analog output and the equipment's performance.

Fault revealing circuitry — This proprietary circuitry significantly reduces the number of inaccurate analog signals by distinguishing between an actual vibration signal and false or intermittent signals caused by a defective transducer or its associated interconnect wiring. When a fault is detected, the analog output is driven below 4 mA and held at approximately 2 mA until the fault has cleared. This enables the process computer to distinguish between a true vibration signal and a Transmitor Not OK condition. To assist with trouble-shooting, each Transmitor has a green OK LED. For easy identification of fault conditions, the OK LED is turned off when a fault condition is detected.

Redundant power input — This enhances system integrity by preventing a single power failure from creating a common cause failure. When redundant power sources are used, each Transmitor will automatically switch over to the alternate power source if the primary power source fails.

Plug-in design — Transmitors are plugged into a system backplane. If a Transmitor fails, the Transmitor can be replaced without disturbing the field wiring or powering down the system. This increases overall availability by allowing "hot insertion."

Epoxy sealed — Each Transmitor has been designed to operate in 100% condensing humidity (non-submerged). This allows you to install a DTM near your machine without fear of failure due to a harsh environment.



Dynamic Transmitor Module shown with Transmitors, backplane and two high current power supplies.

Test input and output — Readily-accessible test terminals enable a technician to input a dynamic signal from a function generator into a Transmitor in order to verify the proper analog output signal. This allows performance verification to be conducted locally, which will reduce the amount of time required to verify or validate the system.

Correct dynamic transducer signal output — Although the Transmitors are powered by +24 Vdc, as opposed to –24 Vdc for a Proximitor®, the dynamic transducer signal output is the same as a Proximitor's. This means a Transmitor's bias voltage, frequency response and phase will be essentially identical to a standard 3300 Series Proximitor. This will eliminate any confusion when it is time for your machinery specialists to diagnose machinery problems.

Designed for many diverse installations and applications

Since a DTM installation does not include a monitor rack, system interconnects and terminations are made in your facility. Because each installation can be different, DTM installation accessories are available which will allow the DTM to be adapted to many applications. Some of these accessories are:

Backplane — The backplane uses wire traces to distribute "like kind" signals from the different Transmitors to terminal blocks located in central areas on the backplane. With this design, for instance, all of the analog signal wires for 12 Transmitors (24 wires total) can be terminated in one area within the DTM enclosure, as opposed to being terminated at 12 different points. This results in a clean and professional installation where all items can be identified. (Note: If you prefer to mount all field devices on DIN rails, individual Transmitor DIN rail mounts may be used instead.)

Keyphasor® unit — Phase reference is an essential part of machinery diagnostics. For this reason, Keyphasor® units may also be plugged into the backplane. The backplane provides power to the Keyphasor® units and routes the Keyphasor® signal to the dynamic output terminal strip.

DTM enclosures — Because installations can be different, four enclosures are available. For corrosive environments, stainless steel enclosures with backplanes inside can be installed. Enclosures, which can accommodate either six or twelve Transmitors and two high current power supplies, can be ordered, depending on the installation requirements. For DIN Rail mount applications, a stainless steel and a plastic resin enclosure, which can accommodate six DIN Rail mount Transmitors and one low current power supply, are available.

Power supplies — For installations where +24 Vdc is not available, two ►

110/220 Vac to +24 Vdc power supplies are available. One is a high current supply which can provide enough power for 12 Transmitors and two Keyphasor® units. It also has an OK relay, which makes it well-suited for redundant power applications. The other is a lower-cost, low current supply capable of providing power for six Transmitors and one Keyphasor® unit. These power supplies may be installed inside the DTM enclosure or in separate enclosures.

Dynamic transducer signal outputs — Access to the dynamic transducer signal is very important for proper machinery management. For this reason, the signal may be accessed three different ways.

First, each Transmitor has a BNC, or coaxial connector similar to those found on the front of 3300 monitors. The same test equipment you have been using with your 3300 monitors can be directly connected to the Transmitor's coaxial connector.

Second, the dynamic transducer signals are available at a terminal strip located on the backplane. Two-wire shielded cables may be terminated here and run to a remote patch panel, eliminating the need to go to the machine to sample dynamic data.

Third, a 25-pin connector is also located on the backplane. This connector is similar to the 25-pin "dynamic signal" connector found on the back of a 3300 Monitor. The 25-pin connector can be used to efficiently transfer the dynamic transducer signals from as many as 12 Transmitors and 2 Keyphasor® units to a nearby dynamic sampling device. For instance, the signals from the 25-pin connector can be wired into Rack Buffered Output TIMs. The TIMs will condition the dynamic signals and enable you to display them on a Trendmaster® 2000 System host computer located in your maintenance office.

These are only some of the features available in the new Dynamic Transmitor Module. DTMs are being field tested and will be available in the first quarter of 1994. A seismic version will be available later in 1994. Contact your sales representative for information on this innovative product offering ■